WHAT IS CLAIMED IS:

1. A fuel cell, comprising:

an anode space;

a cathode space;

a proton-conducting membrane separating the two spaces;

at least one of a hydride-forming substance and a hydrogen-storing substance arranged in the anode space; and

an easily oxidizable substance arranged in the cathode space.

2. The fuel cell according to Claim 1, wherein the at least one of a hydride-forming substance and a hydrogen-storing substance comprises a metal or a metal compound.

3. The fuel cell according to Claim 2, wherein said compound consists of transition metals.

4. The fuel cell according to Claim 2, wherein said compound consists of a Co-doped $LaNi_5$.

5. The fuel cell according to Claim 1, wherein the easily oxidizable substance is a hydroxide compound of a metal.

6. The fuel cell according to Claim 5, wherein the easily oxidizable substance is a transition metal.

7. The fuel cell according to Claim 6, wherein the easily oxidizable substance is $Ni(OH)_2$.

8. A method for operating a fuel cell having an anode space, a cathode space, a proton-conducting membrane separating the two spaces, at least one of a hydride-forming substance and a hydrogen-storing substance arranged in the anode space, and an easily oxidizable substance arranged in the cathode space, said method comprising:

feeding hydrogen to the anode space; and

feeding an oxidant to the cathode space;

whereby fuel cell is operated for generating current, and is simultaneously electrochemically charged.

9. The method according to Claim 8, further comprising operating the electrochemically charged fuel cell as a battery, without the feeding of hydrogen or air oxygen.

10. A motor vehicle having a fuel cell comprising:

an anode space;

a cathode space;

a proton-conducting membrane separating the two spaces;

at least one of a hydride-forming substance and a hydrogen-storing substance arranged in the anode space; and

an easily oxidizable substance arranged in the cathode space.